EFFECT OF RADIAL ARTERY OR SAPHENOUS VEIN CONDUIT AS A SECOND GRAFT ON LATE CLINICAL OUTCOME AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY

To the Editor:

We read with great interest the article by Zacharias and colleagues[1] regarding late outcomes after radial artery (RA) versus saphenous vein (SV) grafting during reoperative coronary artery bypass surgery. We do not support their statement that RA versus SV grafting at reoperation was associated with a late survival benefit analogous to what had been previously reported by the same group[2] when the RA was used as a second arterial conduit in primary coronary artery bypass grafting (CABG) surgery.

In that article[2] data analysis was performed on a retrospective observational CABG series. The cumulative 0- to 6-year survival was better for patients with RA conduits versus propensity-matched patients with SVs as a second conduit (925 patients in each group). It might be reasonable to assume that angiographic graft patency influenced survival. However, the angiographic RA conduit's patency (1.8 ± 1.4 years to redo angiographic analysis) was 68.2%, which is statistically not better ($P = .11$) than the SV graft patency rate (63.3%). The authors pointed out that patency comparison derived from the subcohort of restudied patients who received both RA and SV conduits, in which each patient served as his or her own control subject, has shown significantly better RA graft patency (SV graft angiographic failure rate of 41% vs 23.9% observed for RA conduits, $P = .039$)).[2] Although we are discussing a second conduit of choice in a CABG cohort with an internal thoracic artery to the left anterior descending coronary artery (LAD), each patient can serve as his or her own control subject only if tested conduits (RA or SV) were randomly assigned to graft either the circumflex or the right coronary territory. Furthermore, target vessel stenoses, diameters, and territories of runoff (area of distribution) should be similar and determined in inclusion criteria. Although the authors are proponents of arterial grafting, we assumed that RA conduits were placed to the next best target other than the LAD. If RA conduits were all applied to the largest non-LAD target, the cross-sectional area of their runoff circulation would have been larger than that of the SV grafts performed, which could therefore be expected to fail more readily than the RA grafts. Furthermore, when the SV grafts are used only to the second-best target, patency is 90% at 5 years on optional angiograms and 80% at 9 years in the protocol-directed angiograms (prospective, randomized, single-center trial).[3] Achouh and associates[4] have recently reported a similar angiographic patency rate at 10 years after CABG surgery for both conduits (83% of RA conduits vs 81% of SV grafts).

Hayward and coworkers[5] concluded that use of the RA or SV for the second conduit during primary CABG did not significantly influence clinical outcome at 6 years. There was no significant difference in absolute survival in the RA group versus that seen in the SV group (similar number of patients, 16 deaths in each group, 4 deaths were cardiac in cause in the RA group vs 2 deaths in SV group). Unfortunately, the cause of death is unknown in the patient population of Zacharias and colleagues,[1] and thus the death rate might be independent of cardiac factors.

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Reply to the Editor:

My coauthors and I reviewed the letter by Nezic and colleagues[1] related to our recent article in the Journal.[2] Although we appreciate their opinion, we were surprised that the letter at issue[1] did not discuss our article[2] per se. Rather, it used our recent article as a springboard to jump back to a 2004 article from our group,[3] making essentially the same point as in several previous letters that have discussed other articles comparing the effects on late coronary bypass surgery (CABG) outcomes of use of radial artery (RA) versus saphenous vein (SV) as a second grafting conduit. We stand by our statement that the survival benefit observed with RA versus SV grafting

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after reoperative CABG[2] is indeed analogous (or similar) to that we reported previously after primary CABG.[3] In that respect, we believe that the reported survival comparisons, derived for a general cardiac surgical population (as opposed to selected randomized, controlled trials), are rather self-explanatory and were based on rigorous analyses applying propensity modeling and matching methods.

Nezic and colleagues asserted that the reported comparative RA and SV patency data in the literature do not support the contention that the observed survival benefit is the result of RA patency being superior to that of SV.[1] Here, we believe that it is appropriate to warn against an imbalanced choice of cited literature. Specifically, Nezic and colleagues[1] cited only articles suggesting that RA and SV exhibit similar late patency,[4-6] ignoring any other data that showed superior RA patency.[7] Interestingly, no studies of superior SV to RA patency were cited in their letter. Also, any discussion of SV graft durability should not ignore the sobering SV patency results reported in the PREVENT IV Trial.[8] Finally, we do agree that providing patency data that parallel the survival data findings would be an important addition to some of the survival analyses reported by us and by others. At the same time, we believe that rigorous analyses showing, in the general cardiac surgical population, compelling data regarding the potential survival advantage when RA is used as a second arterial conduit in CABG should not be glossed over.

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CONTRAST MEDIA DOSE, ANGIOGRAPHY TIMING, AND ACUTE RENAL FAILURE AFTER CORONARY OPERATIONS

To the Editor:

We read with interest the recent article of Medalion and coworkers titled ''The Effect of Cardiac Angiography Timing, Contrast Media Dose, and Preoperative Renal Function on Acute Renal Failure After Coronary Artery Bypass Grafting.''[1] The authors found that both high contrast dose at angiography (>1.4 mL/kg), and an operation done up to 5 days after angiography were independent risk factors for postoperative acute renal failure (ARF) in patients who underwent coronary artery bypass grafting.

The authors found partially different results with respect to a similar study that we published in 2008.[2] In that study, we identified that an operation done on the same day as the angiogram was an independent risk factor for ARF after surgery. A high contrast dose (>1.36 mL/kg) was univariately but not independently associated with ARF. Medalion and coworkers[1] hypothesized that this partial discrepancy may result from the dichotomization of the contrast dose based on the median value (whereas they used the upper quartile) and the use of peak creatinine for the definition of ARF (peak creatinine twice the baseline value and >2 mg/dL), whereas they used a 25% decrease of estimated creatinine clearance and creatinine clearance of 60 mL/min or less on day 3.

We think that the main difference between the 2 studies is the definition of ARF. Medalion and coworkers[1] used a more liberal definition (stage 1 of the RIFLE [risk, injury, failure, loss, end-stage kidney disease] criteria)[3] and ended up with a quite high ARF rate (13.6%), whereas our definition was more restrictive (stage 2 of the RIFLE criteria) and led to an ARF rate of 5.7%. Of course, a multivariable analysis with more events as the outcome variable is more likely to accept more independent variables. To check for this hypothesis, we have reanalyzed our data using the same liberal definition of ARF dichotomizing the contrast dose at the upper quartile of the distribution (1.7 mL/kg).

The results of this new analysis are reported in Table 1. A high dose of contrast agent is now an independent risk factor for ARF. However, only operations done on the same day as the angiogram carry an independent association with ARF. Therefore, the discrepancy between our study and the one of Medalion and coworkers[1] remains, with respect to the ''safe'' time that should be applied between the angiogram and the operation. It is certain that contrast-induced